

WHAT IS CLAIMED IS

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A6

1. A solid-state image pickup device, including:  
a pixel portion having unit pixels arranged two-dimensionally in a matrix form, each of said unit pixels including a photoelectrically transducing element for photoelectrically transducing incident light to obtain signal charge, and stocking the signal charge thus obtained, a selection switch for selecting a pixel and a read-out switch for reading out the signal charge from said photoelectrically transducing element to a vertical signal line;

plural amplifying means which are connected to said respective vertical signal lines and convert the signal charge read out to the vertical signal lines to an electrical signal;  
and

plural reset means for resetting each of said vertical signal lines.

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C1

2. The solid-state image pickup device as claimed in claim 1, wherein said photoelectrically transducing element comprises a photodiode having a HAD sensor structure.

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3. The solid-state image pickup device as claimed in claim 1, wherein each of said reset means resets the vertical signal line in synchronism with a read-out timing before one pixel or a horizontal scan timing.

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4. The solid-state image pickup device as claimed in claim 1, wherein each of said reset means resets the vertical

signal line just before the signal charge is read out from said photoelectrically transducing element.

5. The solid-state image pickup device as claimed in claim 1, wherein said selection switch and said read-out switch are connected to each other in series between said photoelectrically transducing element and said vertical signal line.

6. The solid-state image pickup device as claimed in claim 5, wherein said selection switch is disposed at said photoelectrically transducing element side.

7. The solid-state image pickup device as claimed in claim 5, wherein each of said selection switch and said read-out switch comprises an MOS transistor having a double gate structure.

8. The solid-state image pickup device as claimed in claim 7, wherein each gate electrode of said selection switch and said read-out switch comprises a two-layer gate electrode, and neighboring portions are overlapped with each other.

9. The solid-state image pickup device as claimed in claim 1, wherein said read-out switch is connected between said photoelectrically transducing element and said vertical signal line, and said selection switch is connected between a control electrode of said read-out switch and a read-out pulse line.

10. The solid-state image pickup device as claimed in claim 9, wherein said selection switch comprises a depression

type MOS transistor.

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11. The solid-state image pickup device as claimed in claim 1, wherein a horizontal selection switch for commonly outputting a reset level on said vertical signal line at a reset time of said reset means and a signal level read out onto said vertical signal line after the reset is provided between said vertical signal line and said horizontal signal line.

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12. The solid-state image pickup device as claimed in claim 11, further including a differential circuit for calculating the difference between the reset level successively output by said horizontal selection switch and the signal level.

13. The solid-state image pickup device as claimed in claim 12, wherein said differential circuit comprises a correlation double sampling circuit.

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14. A method of driving a solid-state image pickup device, characterized in that in a solid-state image pickup device including a pixel portion having unit pixels arranged two-dimensionally in a matrix form, said unit pixel including a photoelectrically transducing element for photoelectrically transducing incident light to obtain signal charge and stocking the signal charge thus obtained, a selection switch for selecting a pixel and a read-out switch for reading out the signal charge from said photoelectrically transducing element to a vertical signal line; plural amplifying means which are

connected to said respective vertical signal lines and convert the signal charge read out to the vertical signal lines to an electrical signal; the vertical signal line is first reset and then a pixel signal is read out from said photoelectrically transducing element to the vertical signal line to successively output the reset level and the signal level in this order through the same route, and thereafter the difference between the reset level and the signal level is calculated.

15. The solid-state image pickup device driving method as claimed in claim 14, wherein neighboring vertical selection lines are simultaneously driven two by two in turn, and signal charges of two pixels in the vertical direction are mixed with each other on the vertical signal line.

16. A camera including:

an optical system for focusing incident light from a subject onto a solid-state image pickup device;

a driving system for driving said solid-state image pickup device; and

a signal processing system for processing an output signal of said solid-state image pickup device, wherein said solid-state image pickup device, includes a pixel portion having unit pixels arranged two-dimensionally in a matrix form, each of said unit pixels including a photoelectrically transducing element for photoelectrically transducing incident light to obtain signal charge, and stocking the signal

charge thus obtained, a selection switch for selecting a pixel and a read-out switch for reading out the signal charge from said photoelectrically transducing element to a vertical signal line, and plural amplifying means which are connected to said respective vertical signal lines and convert the signal charge read out to the vertical signal lines to an electrical signal, and wherein said driving system drives said solid-state image pickup device so that the vertical signal line is first reset and then a pixel signal is read out from said photoelectrically transducing element to the vertical signal line to successively output the reset level and the signal level in this order through the same route, and thereafter calculates the difference between the reset level and the signal level.

17. The camera as claimed in claim 16, wherein neighboring vertical selection lines of said solid-state image pickup device are simultaneously driven two by two in turn, and signal charges of two pixels in the vertical direction are mixed with each other on the vertical signal line to perform an interlace-supporting feedback read-out operation.